

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1-46. (Canceled)

47. (Currently Amended) A bone fixation apparatus comprising:

a bone fixation plate having a fixation hole;

a fastener shaft received in the fixation hole and including a first portion having an outer surface defining a first cam and a second bone-engaging portion; and

an annular member received in the fixation hole and including an inner surface defining a second cam for cooperating with the first cam to selectively move the annular member in a radial direction between an unexpanded position permitting movement of the fastener shaft and annular member relative to the fixation hole and an expanded position restricting movement of the fastener shaft and annular member relative to the fixation hole, the annular member including at least one engagement formation operable to receive a tool to move the annular member-being-moved between the expanded position and the unexpanded position by rotation of the annular member relative to the fastener shaft following insertion of the fastener shaft into a bone.

48. (Previously Presented) The bone fixation apparatus of claim 47, wherein the first and second cams are configured to provide a semi-constrained mode of

operation in which the fastener shaft is retained relative to the plate and the annular member is free to move within the fixation hole.

49. (Previously Presented) The bone fixation apparatus of claim 47, wherein the annular member has a curved outer surface mating with an inner surface of the fixation hole.

50. (Previously Presented) The bone fixation apparatus of claim 49, wherein the outer surface of the annular member and an inner surface of the fixation hole are spherical.

51. (Previously Presented) The bone fixation apparatus of claim 47, wherein the annular member has an expanded diameter sufficiently large to press against the fixation hole and arrest relative movement between the fixation hole and the fastener shaft in the expanded position.

52. (Previously Presented) The bone fixation apparatus of claim 47, wherein the expanded position includes a first expanded position permitting movement of the fastener shaft and annular member relative to the fixation hole and a second expanded position preventing movement of the fastener shaft and annular member relative to the fixation hole.

53. (Previously Presented) The bone fixation apparatus of claim 47, wherein each of the first and second cams include three continuously curved lobes.

54. (Previously Presented) The bone fixation apparatus of Claim 47, wherein the fixation plate is a spinal fixation plate for securing first and second vertebral bodies relative to one another.

55. (Previously Presented) The bone fixation apparatus of Claim 47, wherein the fastener shaft defines a circumferentially extending groove having a reduced diameter and the annular member is carried by the fastener shaft in the circumferentially extending groove.

56. (Previously Presented) The bone fixation apparatus of Claim 47, wherein the annular member is coupled to the fastener shaft for relative articulation therewith.

57. (Previously Presented) The bone fixation apparatus of Claim 47, wherein movement of the annular member between the expanded position and the unexpanded position is independent from longitudinal translation of the fastener shaft relative to the annular member.

58. (Currently Amended) A bone fixation apparatus comprising:
a bone fixation plate having a fixation hole;

a fastener shaft having a bone-anchoring portion and an upper portion defining an outer cam; and

an annular member having an outer surface, ~~and an inner surface~~ defining an inner cam, and at least one engagement formation, the at least one engagement formation operable to receive a tool to rotate the annular member and cause the inner cam to cooperating-cooperate with the outer cam of the fastener shaft to move the annular member between an unexpanded position and an expanded position independent from movement of the fastener shaft relative to the bone fixation plate.

59. (Previously Presented) The bone fixation apparatus of claim 58, wherein the inner cam and the outer cam are configured to provide a semi-constrained mode of operation in which the fastener shaft is retained relative to the plate and the annular member is free to move within the fixation hole.

60. (Previously Presented) The bone fixation apparatus of claim 58, wherein the annular member has an expanded diameter sufficiently large to press against the fixation hole and arrest relative movement between the fixation hole and the fastener shaft in the expanded position.

61. (Previously Presented) The bone fixation apparatus of claim 58, wherein the expanded position includes a first expanded position permitting movement of the fastener shaft and annular member relative to the fixation hole and a second expanded

position preventing movement of the fastener shaft and annular member relative to the fixation hole.

62. (Previously Presented) The bone fixation apparatus of claim 58, wherein the fixation plate is a spinal fixation plate for securing first and second vertebral bodies relative to one another.

63. (Previously Presented) The bone fixation apparatus of claim 58, wherein the fastener shaft defines a circumferentially extending groove having a reduced diameter and the annular member is carried by the fastener shaft in the groove such that the annular member is coupled to the fastener shaft for relative articulation therewith.

64. (Previously Presented) The bone fixation apparatus of claim 57, wherein the annular member is selectively moved between the expanded position and the unexpanded position by rotation of the annular member relative to the fastener shaft.

65. (Currently Amended) A bone fixation apparatus comprising:
a bone fixation plate having a fixation hole;
a fastener shaft having a longitudinal axis extending between a first end and a second end thereof;

a circumferential groove formed in the fastener shaft, ~~the groove spaced apart from each of the first end and the second end of the fastener shaft~~ and having at least one cam surface; and

an annular member carried in the groove of the fastener shaft for relative articulation with the fastener shaft, the annular member having at least one engagement formation and defining an outer surface received within the fixation hole to allow orientation of the fastener shaft at various angles relative to the bone fixation plate, the annular member having an inner surface cooperating with the at least one cam surface of the fastener shaft to radially expand the annular member from an unexpanded position to an expanded position when a force is applied to the annular member at the at least one engagement formation ~~for preventing to restrict~~ the fastener shaft from backing out of the fixation hole.

66. (Previously Presented) The bone fixation apparatus of claim 65, wherein the inner surface of the annular member and the outer surface of the fastener shaft are cooperatively configured to provide a semi-constrained mode of operation in which the fastener shaft is retained relative to the plate and the annular member is free to move within the fixation hole and a constrained mode of operation in which the fastener shaft is retained relative to the plate and the annular member is fixed in the fixation hole.